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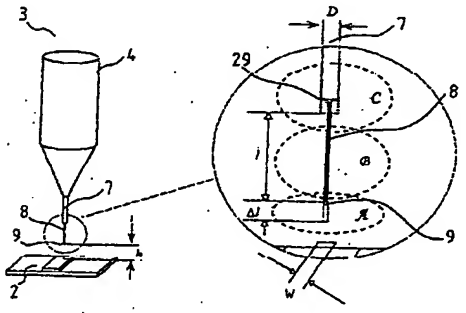
(54) Title: A METHOD AND APPARATUS FOR INSPECTION OF HIGH FREQUENCY AND MICROWAVE HYBRID CIRCUITS AND PRINTED CIRCUIT BOARDS




a b

(57) Abstract: The invention relates to a method and apparatus for the inspection of high frequency and microwave circuits such as printed test circuit boards. The invention uses a probe or antenna (3) which is separated from the device under test (DUT) (2). The invention provides a relatively long central protruding conductor (8) for the antenna (3) which protrudes from its shielding (7). In the method , the antenna (3) is used to acquire microwave electromagnetic field measurements in a near field region of a test point of the DUT (2). Generally, this is done at two test positions with a difference in separation ($\Delta l$) between the apex (8) of the antenna (3) and the DUT (2). The two test results are calculated and recorded and the difference of the microwave properties of the two tests is obtained to provide information about the operation of the DUT (2). The antenna (3) can be either a straight electric field antenna or loop antenna. Further, the antenna (3) can be inclined to the vertical and thus it is possible, by taking a series of measurements, to obtain both the phase and frequency of the currents being carried by the DUT (2) when it is energised.

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A. CLASSIFICATION OF SUBJECT MATTER
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According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 G01R

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category ° | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| X | US 5 900 618 A (WELLSTOOD FREDERICK CHARLES ET AL) 4 May 1999 (1999-05-04) cited in the application | 1-15,21 |
| Y | abstract; figures 1A,6 column 3, line 1 - line 8 column 2, line 16 - line 58 | 16-20 |
| A | figure 8 | 22 |
| X,P | US 2003/001596 A1 (HAYASHI YOSHIHIKO ET AL) 2 January 2003 (2003-01-02) abstract; figures 1-3,12,13 | 1,2,4-6, 10-15 |
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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
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| Y | R. KANTOR, M. LESNAK, N. BERDUNOV, I.V. SHVETS: "method for increasing sensitivity of shear-force distance control for scanning near-field microscopy" APPLIED SURFACE SCIENCE, 1999, pages 510-513, XP002252181 abstract | 16-20 |
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| X | US 6 173 604 B1 (GAO CHEN ET AL) 16 January 2001 (2001-01-16) figures 2,2A,16 column 5, line 58 -column 9, line 28 claim 11 | 22-24 |